A Course Based Project Report on

PARKING LOT SYSTEM

Submitted to the

Department of CSE- (Cys , DS) and AI&DS

in partial fulfilment of the requirements for the completion of course

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LABORATORY

(22PC1IT201)

BACHELOR OF TECHNOLOGY

IN

Department of CSE – (Cyber Security)

Submitted by

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An Autonomous Institute, NAAC Accredited with 'A++' Grade, NBA

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VALLURUPALLI NAGESWARA RAO VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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DEPARTMENT OF INFORMATION TECHNOLOGY

CERTIFICATE

This is to certify that the project report entitled "Parking Lot System" is a bonafide work done under our supervision and is being submitted by Miss. NAGA UDAYA SRI (22071A6236), MR. SRI PRATHAMESH (22071A6237), MR. HEMANTH REDDY (220716239), MISS.NIKITHA(220716241) in partial fulfilment for the award of the degree of Bachelor of Technology in Computer Science and Engineering – Cyber Security , of the VNRVJIET, Hyderabad during the academic year 20232024.

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DECLARATION

We declare that the course based project work entitled "Parking Lot System." submitted in the Department of CSE – (Cys ,DS) and AI&DS , Vallurupalli Nageswara Rao Vignana Jyothi Institute of Engineering and Technology, Hyderabad, in partial fulfilment of the requirement for the award of the degree of Bachelor of Technology in CSE – Cyber Security is a bonafide record of our own work carried out under the supervision of P.Devika, Assistant Professor, Department of CSE – (Cys ,DS) and AI&DS, VNRVJIET. Also, we declare that the matter embodied in this thesis has not been submitted by us in full or in any part thereof for the award of any degree/diploma of any other institution or university previously.

Place: Hyderabad.

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ABSTRACT

The "Airport Parking System" is a Java-based application that assists users in finding available parking slots at an airport. The program utilizes a 2D array to represent parking vacancies, employing binary values to indicate slot availability. The user is prompted to input the desired parking duration in hours, and the system then displays available slots based on specific criteria.

The criteria for slot preference include corner vacancies for durations less than or equal to two hours and all vacancies for durations exceeding two hours. After presenting available slots, the user is prompted to choose a preferred parking space. The system checks the selected slot's availability and, if vacant, successfully books the parking space. The application calculates parking charges based on the chosen duration, applying different rates for durations below or above two hours.

The project demonstrates basic array manipulation, user input handling, and decisionmaking logic for efficient airport parking slot management. The concise and userfriendly interface ensures ease of use for both the application developers and endusers.

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INTRODUCTION

1.1 PROBLEM DEFINITION

To create a system in which users can choose the parking space out of available one according to time. We need to provide the information regarding the vacancy in parking place according to their parking time. Based on their preferences we need to charge them on hourly basis. According to our analysis we observed that people face lot of difficulty in choosing the right place to park their vehicles. So we have designed a program in which user finds it easy to park their vehicles efficiently.

1.2 OBJECTIVE

It is obvious that public parking stalls are unorganised so we came up with a solution in which parking stalls get digitalized and functions efficiently without any damage to the vehicles parked. As world is getting digitalized, this became a high time that

even parking system needs modernization with technology.

1.3 OVERVIEW

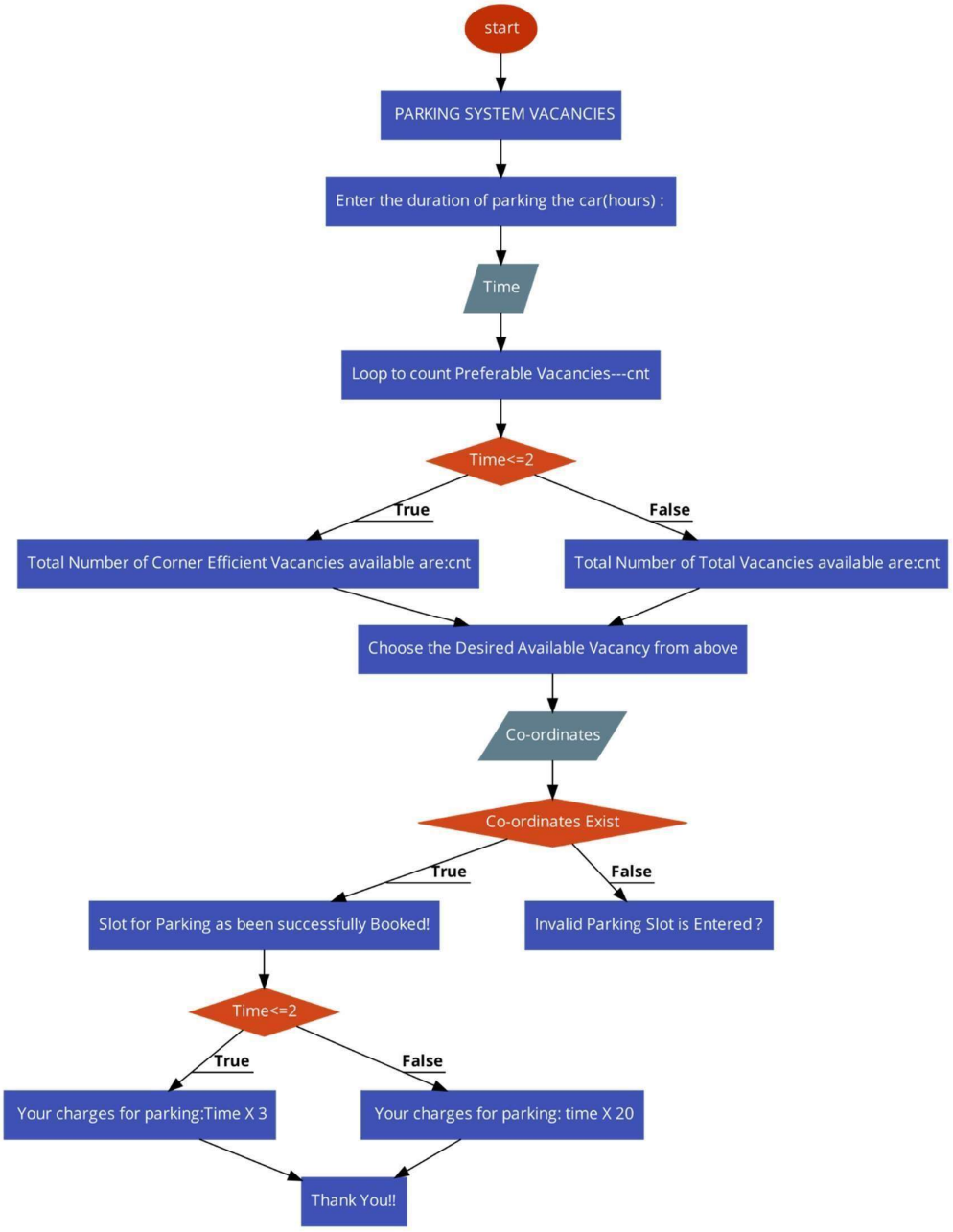
The system provides the information of available spaces out of all and asks the user to choose the time for which they want to park.

Based on their time they will be charged a nominal parking fee.

In the era of innovations people are getting digitalized day by day in order to that people choose an efficient and technological way to choose the safest parking lot. So in future it would be the biggest market place to make money in.

A proper net connection is essential to access the available parking spaces or to enter the time of parking by passenger and displaying the user about the fair for parking

FLOW CHART


start
PARKING SYSTEM VACANCIES
Enter the duration of parking the car(hours) :
Time
Loop to count Preferable Vacancies---cnt
Time<=2
True
False
Total Number of Corner Efficient Vacancies available are:cnt
Total Number of Total Vacancies available are:cnt
Choose the Desired Available Vacancy from above
Co-ordinates
Co-ordinates Exist
True
False
Slot for Parking as been successfully Booked!
Invalid Parking Slot is Entered ?
Time<=2
True
False
Your charges for parking:Time X 3
Your charges for parking: time X 20
Thank You!!

CHAPTER-2

SOURCE CODE

```
import java.util.Scanner; public class
Airport{    public static void main(String[]
args) {
    System.out.println("\u001B[44m\tAIRPORT'S    PARKING    SYSTEM
VACANCIES:\u001B[0m\n");
    int i, j, cnt = 0, time = 0, p1, p2;    int[][] array
= {
        {1, 1, 0, 0, 1, 1, 0, 1, 1, 0},
        {0, 0, 1, 1, 0, 1, 1, 0, 1, 0},
        {1, 0, 1, 1, 0, 0, 1, 0, 1, 1},
        {0, 1, 0, 0, 1, 1, 0, 0, 0, 1},
        {1, 1, 0, 1, 0, 0, 1, 1, 1, 0}
    };
    Scanner scanner = new Scanner(System.in);    for
(int user = 1; user <= 10; user++) {
        System.out.println("\u001B[45m\t\tOptions\t\t\u001B[0m\n\t1. Book a new
        slot\n\t2. Exit\n");
        System.out.print("Choose one from above: ");
int option=scanner.nextInt();    switch(option){
case
1:System.out.println("Start booking");
```

```
                break;
            case 2:System.out.println("Thank You");
break;              default:System.out.println("Please choose a valid
option.");
        }
        if(option==1){
            System.out.print("User " + user + ": Enter the duration of parking the car
(hours): ");              time
= scanner.nextInt();
            System.out.println("\u001B[44m\tAIRPORT'S              PARKING
            SYSTEM              VACANCIES (Updated):\u001B[0m\n");
            cnt = 0;              for (i = 0; i < 5; i++) {                  for (j = 0; j < 10; j++) {
if (array[i][j] == 0 && (i == 0 || i == 4 || j == 0 || j == 9) && time <= 2) {
                    System.out.print("\u001B[42m(" + (i + 1) + " , " + (j + 1) +
                    ")\u001B[0m  ");
                    cnt++;
                } else if (time > 2 && array[i][j] == 0) {
                    System.out.print("\u001B[42m(" + (i + 1) + " , " + (j + 1) +
                    ")\u001B[0m ");
                    cnt++;
                }
            }
            System.out.println();
        }
```

```
        if (time <= 2)
            System.out.println("\nTotal Number of Corner Efficient
Vacancies available are: " + cnt);          else
            System.out.println("\nTotal Number of Total Vacancies available are: " +
            cnt);
        System.out.print("User " + user + ": Choose the Desired Available
Vacancy  from above: ");          p1 = scanner.nextInt();          p2 =
scanner.nextInt();          if (array[p1 - 1][p2 - 1] == 0) {
            System.out.println("User " + user + ": Slot for Parking (" + p1 + "," + p2 +
            ") has been successfully Booked!");              if (time <= 2)
System.out.println("User " + user + ": Your charges for              parking: " +
time * 30);              else System.out.println("User " + user + ": Your charges for
parking: " +      time * 20);
            System.out.println("User " + user + ": Thank You!!");
// Mark the chosen slot as booked              array[p1 - 1][p2 - 1]
= 1;
        } else {
            System.out.println("User " + user + ": Invalid Parking Slot is Entered?");
        }


          try
{
            Thread.sleep(2000);          } catch
(InterruptedException e) {
```

```
                e.printStackTrace();
            }       }
        else{
        break;      }
          }
       }
```

CHAPTER-3

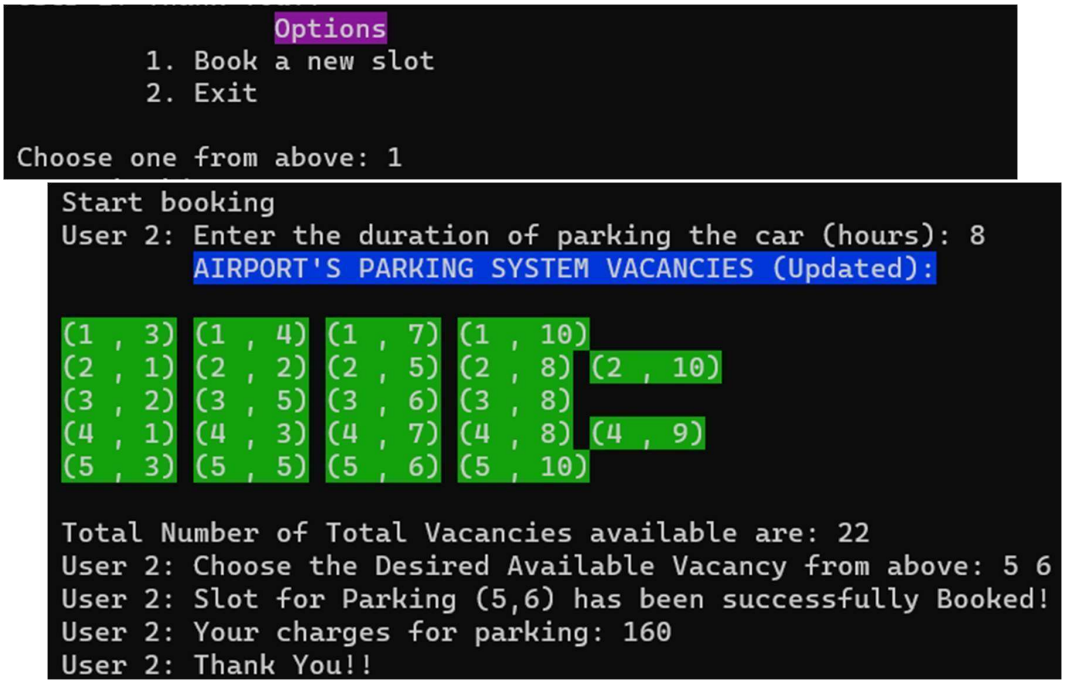
TEST CASES/ OUTPUT

Output 1:

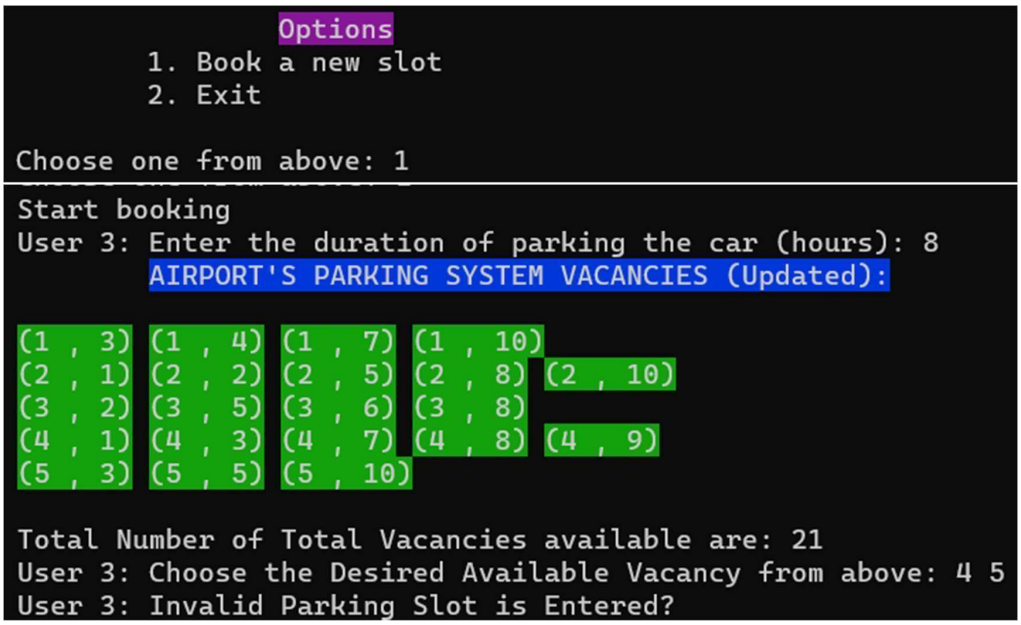
```
C:\Users\SSD\Desktop\java cbp>javac Airport.java

C:\Users\SSD\Desktop\java cbp>java Airport.java
        AIRPORT'S PARKING SYSTEM VACANCIES:

                Options
        1. Book a new slot
        2. Exit

Choose one from above: 1
```

```
Choose one from above: 1
Start booking
User 1: Enter the duration of parking the car (hours): 7
        AIRPORT'S PARKING SYSTEM VACANCIES (Updated):

(1 , 3) (1 , 4) (1 , 7) (1 , 10)
(2 , 1) (2 , 2) (2 , 5) (2 , 8) (2 , 10)
(3 , 2) (3 , 5) (3 , 6) (3 , 8)
(4 , 1) (4 , 3) (4 , 4) (4 , 7) (4 , 8) (4 , 9)
(5 , 3) (5 , 5) (5 , 6) (5 , 10)

Total Number of Total Vacancies available are: 23
User 1: Choose the Desired Available Vacancy from above: 4 4
User 1: Slot for Parking (4,4) has been successfully Booked!
User 1: Your charges for parking: 140
User 1: Thank You!!
```

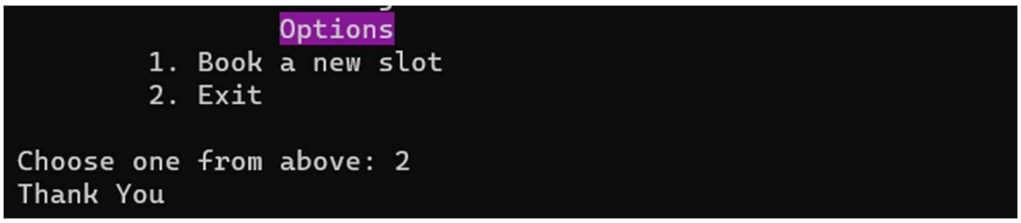
Output 2:


Options
1. Book a new slot
2. Exit
Choose one from above: 1
Start booking
User 2: Enter the duration of parking the car (hours): 8
AIRPORT'S PARKING SYSTEM VACANCIES (Updated):
(1 , 3) (1 , 4) (1 , 7) (1 , 10)
(2 , 1) (2 , 2) (2 , 5) (2 , 8) (2 , 10)
(3 , 2) (3 , 5) (3 , 6) (3 , 8)
(4 , 1) (4 , 3) (4 , 7) (4 , 8) (4 , 9)
(5 , 3) (5 , 5) (5 , 6) (5 , 10)
Total Number of Total Vacancies available are: 22
User 2: Choose the Desired Available Vacancy from above: 5 6
User 2: Slot for Parking (5,6) has been successfully Booked!
User 2: Your charges for parking: 160
User 2: Thank You!!

Output 3:



Output 4:



CHAPTER-4

CONCLUSION

The Airport Parking System presented here stands as a robust and effective solution for the management of parking availability within the dynamic environment of an airport. By leveraging a binary 2D array to represent parking slots, the system intelligently guides users to select optimal spaces based on their preferences and the anticipated duration of parking.

The system excels in efficiently presenting available parking slots, using a binary array to visually represent the status of each space. This approach not only simplifies the process of identification but also allows for a quick assessment of parking availability at a glance. The utilization of a 2D array provides a structured and systematic approach to parking lot management.

The user-centric design of the system is evident in the consideration given to user preferences. By prioritizing corner vacancies for shorter durations (two hours or less), the system aims to enhance user convenience and expedite the parking selection process. This approach aligns with the goal of providing a seamless and user-friendly experience for airport patrons.

A notable feature of the Airport Parking System is its dynamic charging logic. By calculating parking charges based on the chosen duration, the system aligns itself with the varying needs of airport users. The differentiation in charges for short-term and long-term parking reflects a thoughtful approach to pricing that takes into account both user convenience and cost-effectiveness.

The cumulative result is a practical and well-rounded solution tailored to the unique challenges posed by airport parking management. The system's ability to adapt to different parking durations, coupled with the clear presentation of available slots, positions it as a valuable tool for streamlining the parking experience at airports.

In conclusion, the Airport Parking System not only addresses the immediate need for efficient parking management but also lays the groundwork for a versatile and adaptable solution that can evolve with the changing demands of airport facilities. Through thoughtful design and functionality, this system serves as a testament to the potential for technology to enhance the everyday experiences of airport users.

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